UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/871,630	06/04/2001	Hideki Sato	35.C15410	3202

5514 7590 12/12/2003

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
CHANG, AUDREY Y	
ART UNIT	**PAPER NUMBER**
2872	

DATE MAILED: 12/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/871,630	SATO, HIDEKI	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,6,8 and 9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,6,8 and 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *11*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 15, 2003 has been entered.

2. This Office Action is also in response to applicant's amendment filed on September 15, 2003, which has been entered as paper number 12.

3. By this amendment, the applicant had amended claims 1, 3, 8 and 9 and has canceled claim 4.

4. Claims 1-3, 5, 6, 8 and 9 remain pending in this application.

Drawings

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "7" for the metal mold. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

6. **Claims 2-3 are objected to because of the following informalities:**

(1). The phrase "a projection area" recited in claim 2 is indefinite since it is not clear what is considered to be "the projection area".

(2). The phrase "the reduction in the optical performance caused by manufacturing imperfections" recited in claim 3 is vague and indefinite since it is not clear how to quantify such "imperfections" and it is not clear how could such be measured and compared.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-3, 5-6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to the patent issued to Imamura et al (PN. 5,847,877) in view of the US patent issued to Harris (PN. 5,496,616) and Japanese patent issued to Hiroshi, (JP 10-123388 A).

Imamura et al teaches a *diffractive optical element* having a plurality of *grating surface structures* (21 and/or 22), *serve as the first and the second diffractive optical parts*, that are formed at interfaces of different materials, serves as the first and second substrates, having different refractive indices and different dispersions wherein the substrates (11 and 13 Figure 14)) are accumulated with a space (layer 12) there between, (please see Figures 11-15). Although this reference does not teach explicitly that the space layer is an air layer however since Imamura et al teaches explicitly about how the layers materials are related to each other in order to design the diffractive optical element with desired optical properties and since air layer is a well known optical layer material in the art for designing diffractive optical element it would have been obvious to one skilled in the art to choose the space layer to be an air layer. Since it has been held to be within the general skill of a worker in the art to select a ***known material*** on the basis of its ***suitability*** for the intended used as a matter of obvious design choice. In re Leshin, 125 USPQ 416. Furthermore, **Harris** in the same field of endeavor teaches an optical diffractive element for correcting non-uniform diffraction efficiency in binary diffractive optical element wherein two binary diffractive optical elements (10 and 24) are laminated to each other with an air gap interposed between them to create desired optical path for achieving desired phase variations. It would

then have been obvious to one skilled in the art to apply the teachings of Harris to introduce air gap between the diffractive optical parts of Imamura et al for the benefit of creating desired phase variation to the diffractive optical element. It is implicitly true that the grating surface structures of Imamura are of *phase type nature.*

The Imamura reference has met all the limitations of the claims with the exception that it fails to teach to include alignment marks formed on each of the first and second diffractive optical parts for alignment purpose. However to use alignment markings formed on the optical elements in order to engage the optical elements in good alignment is rather a well known practice in the art as taught by **Hiroshi**. **Hiroshi** teaches that the alignment markings (21a and 22a, Figure 2) may be formed at center locations of the surfaces of the two mutually adjacent lenses (21) and (22) such that the corresponding recess and protrusion of the alignment markings may be engaged to each other and aligned in order to make the lenses in good alignment, (please see Figure 2). It would then have been obvious to one having ordinary skill in the art to apply the teachings of Hiroshi to modify the diffractive optical element of Imamura et al to form alignment markings on the plurality of the diffractive optical parts for the benefit of achieving a better alignment.

With regard to claim 2, Imamura et al does not teach explicitly that the diffractive optical parts have gratings formed into concentric circular shape. However such grating design is very standard in the art as demonstrated by the teachings of **Harris** wherein the binary grating lens (10) has a diffraction grating formed into concentrical circular shape, (please see Figure 1 of Harris). Such modification would therefore have been obvious to one skilled in the art for the benefit of providing a diffractive optical element with desired symmetric diffraction property. With regard to claim 3, the alignment marks as taught by Hiroshi must have no influence to the optical performance of the optical lenses.

With regard to claim 5 although this reference (Hiroshi) does not teach explicitly about the depth of the alignment markings. However such modification is considered to be obvious matter of design

choices to one having ordinary skill in the art since as long as the alignment markings are capable of engaging two optical elements to each other to assure the alignment the actual depth has no criticality.

With regard to claims 6 and 7, it is implicitly true that the diffractive optical element could be utilized in an optical system and apparatus.

With regard to claim 8, Imamura et al teaches the diffractive optical element has laminated diffractive optical parts but it does not teach explicitly the diffractive optical parts are made by using molding process. However molding process, as taught by Harris, is a standard process for making diffractive optical element, (please see column 9, lines 39-54). It would then have been obvious to one skilled in the art to apply the teachings of Harris to use the molding process to make the diffractive optical elements of Imamura et al for the benefit of making this diffractive optical element with standard procedure which can save the cost of manufacture. The lamination process is implicitly included for forming the laminated diffractive optical element. Hiroshi teaches that the alignment markings are formed by molding process. It would then have been obvious modification to one skilled in the art to use molding process to make the alignment markings for the benefit of ensuring proper alignment of the two diffractive parts.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Harris et al (PN. 5,214,535) in view of Japanese patent issued to Hiroshi.

Harris et al teaches a binary diffractive optical lens wherein the lenses are made by using standard molding process, (please see column 4, lines 60-69). Harris et al teaches that a mold with negative of the binary diffractive optics lens pattern is used such that the negative is pressed on a flat soft coating on a hard substrate to form the binary diffractive optical lens. Harris et al teaches that the mold is made of *nickel* which is a *metal*, (please see column 4, lines 66). Harris et al further teaches that alignment markings may be formed on predetermined location of the surface of the binary diffractive

optics lenses in order to ensure the alignment. But it does not teach that the alignment markings are provided at the diffractive part. **Hiroshi** in the same field of endeavor teach to provide alignment recess and protrusion (21a and 22a) at the center of mutually adjacent lenses for the benefit of ensuring the proper alignment of the two lenses, (please see Figure 2). Hiroshi teaches that the alignment markings may be made at molding process of the lens elements, (please see the abstract). It would then have been obvious to one skilled in the art to modify the mold of Harris et al to make the alignment markings in the area of the diffractive part as an alternative design for the benefit of achieving the proper alignment as desired.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1-2,5-6, 8 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 and 8 of copending Application No. ***09/401,660***. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both recite a diffractive optical element having laminated first and second diffractive optical gratings and alignment markings for aligning the two optical gratings.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

12. Claims 1-3, 5-6 and 8 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 of U.S. Patent No. (patent number not assigned yet, US application number 09/411,632). Although the conflicting claims are not identical, they are not patentably distinct from each other because they both recite a diffractive optical element having laminated first and second diffractive optical gratings and alignment markings for aligning the two optical gratings.

Response to Arguments

13. Applicant's arguments with respect to claims 1-3, 5-6 8 and 9 have been considered but are moot in view of the new ground(s) of rejection.

14. Applicant's arguments are mainly drawn to newly amended claims and they are addressed in the paragraphs above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Audrey Y. Chang
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.